CLAIMS

It is claimed:

1. An image sensor unit comprising

a first photoconverter comprising a first array of first light receiving elements, the first photoconverter for photoelectrically converting light of a first light quality from a source image for outputting first signals by photoelectric conversion, the first signals having a first image quality

a second photoconverter comprising a second array of second light receiving elements, the second photoconverter for photoelectrically converting light of a second light quality from the source image for outputting second signals by photoelectric conversion, the second signals having a second image quality, wherein the second image quality is better than the first image quality

a signal correction unit to

produce first enhanced signals corresponding to the first light quality from the source image

use the second signals to modify the first signals to produce the first enhanced signals.

2. The image sensor unit of claim 1 wherein

the first photoconverter is a color photoconverter

the second photoconverter is a monochrome photoconverter.

3. The image sensor unit of claim 1 wherein

the first light quality comprises a first color

the second light quality comprises black and white

the image sensor comprises a third photoconverter comprising a third array of third light receiving elements, the third photoconverter for photoelectrically converting light of a third light quality from the source image for outputting third signals by photoelectric conversion, the third light quality comprising a second color different from the first color

the image sensor comprises a fourth photoconverter comprising a fourth array of fourth light receiving elements, the fourth photoconverter for photoelectrically converting light of a fourth light quality from the source image for outputting fourth signals by photoelectric conversion, the fourth light quality comprising a third color different from the first color and the second color

the signal correction unit further to

produce second enhanced signals corresponding to the third light quality from the source image

produce third enhanced signals corresponding to the fourth light quality from the source image

use the second signals to modify the third signals to produce the second enhanced signals

use the second signals to modify the fourth signals to produce the third enhanced signals.

4. An image reading apparatus including the image sensor unit of claim 3 and further having a color mode, wherein the image sensor outputs color signals and monochrome signals.

5. The image reading apparatus of claim 4 wherein the signal correction unit is further for improving the color signals' gradation.

6. The image reading apparatus of claim 4 wherein the color signals are signals of three primary colors and the signal correction unit is for converting the three primary color signals and the monochrome signals to data indicating color characteristics.

7. A process for producing image signals comprising

providing a first photoconverter comprising a first array of first light receiving elements

providing a second photoconverter comprising a second array of second light receiving elements

the first photoconverter photoelectrically converting light of a first light quality from a source image

the second photoconverter photoelectrically converting light of a second light quality from the source image

outputting first signals from the first photoconverter having a first quality of a characteristic

outputting second signals from the second photoconverter having a second quality of the characteristics better than the first quality

enhancing the first quality using the second signals.

8. The process for producing image signals of claim 7 wherein

the first photoconverter is a color photoconverter

the second photoconveerter is a monochrome photoconverter.

9. The process for producing image signals of claim 7 wherein the first light quality comprises a first color and the second light quality comprises black and white, the process further comprising

providing a third photoconverter comprising a third array of third light receiving elements

providing a fourth photoconverter comprising a fourth array of fourth light receiving elements

the third photoconverter photoelectrically converting light of a third light quality from the source image, the third light quality comprising a second color different from the first color

the fourth photoconverter photoelectrically converting light of a fourth light quality from the source image, the fourth light quality comprising a third color different from the first color and the second color

outputting third signals from the third photoconverter having a third quality of the characteristic

outputting fourth signals from the fourth photoconverter having a fourth quality of the characteristic

enhancing the third quality using the second signals

enhancing the fourth quality using the second signals.

10. The process for producing image signals of claim 7, wherein the first signals are color signals and the second signals are monochrome signals.

11. The process for producing image signals of claim 9 wherein the characteristic comprises resolution.

12. The process for producing image signals of claim 9 wherein the characteristics comprises gradation.

13. A process for producing image signals comprising

receiving a first color image signal for a first color

receiving a second color image signal for a second color

receiving a third color image signal for a third color

receiving monochrome image signals for black and white

improving a quality of at least one of the first, second and third color signals using information in the monochrome signals.

14. The process for producing image signals of claim 13 wherein the first color is red, the second color is green and the third color is blue.

15. The process for producing image signals of claim 13 comprising improving the quality by

obtaining brightness signals from the monochrome image signals

obtaining a first color difference signal from the first, second and third color image signals

obtaining a second color difference signal from the first, second and third color image signals

obtaining enhanced first color image signals from the brightness signals and the first color difference signals

obtaining enhanced second color image signals from the brightness signals, the first color difference signals and the second color difference signals

obtaining enhanced third color image signals from the brightness signals and the second color difference signals.

16. The process for producing image signals of claim 13 wherein the enhanced first, second and third color image signals have improved resolution over the first, second and third color image signals.

17. The process for producing image signals of claim 13 wherein the enhanced first, second and third color image signals have improved gradation over the first, second and third color image signals.

18. The process for producing image signals of claim 13 comprising improving the quality by

obtaining brightness signals from the monochrome image signals

obtaining a first color difference signal from the first, second and third color image signals

obtaining a second color difference signal from the first, second and third color image signals

obtaining enhanced first color image signals from the brightness signals and at least one of the first and second color difference signals

obtaining enhanced second color image signals from the brightness signals and at least one of the first and second color difference signals

obtaining enhanced third color image signals from the brightness signals and at least one of the first and second color difference signals.

19. A color signal compensation circuit comprising:

a first conversion circuit which converts the pixel data of three types of color signals, having different color ingredients respectively which were obtained by processing the output signal from the image sensor unit, and the B/W pixel data, which resolution is higher than that of each color signal, into the data which represents characteristics of each color

a second conversion circuit which inversely converts the data, representing characteristics of each color, into the pixel data of three types of color signals so that the resolution of the color signals corresponds to that of the B/W signal.

20. The color compensation circuit of claim 19 wherein the first conversion circuit converts the pixel data having three different color signals and B/W data into the pixel data of the first and second color-difference signals and the pixel data corresponds to the pixel

position of the B/W signal, and inversely converts the pixel data of the first and second color-difference signals and the pixel data of the luminescent signal into the pixel data of the three types of color signals so that the resolution of the converted color signals correspond to the resolution of the B/W signal.

21. The color compensation circuit of claim 19 wherein the three types of the color signals are the three primary signals.

22. An image reading apparatus comprising:

three types of light receiving element arrays in which a plurality of the light receiving elements, which perform photoelectric conversion on the reflected light from the original paper, are arranged in the main scanning direction

an image sensor unit having a light receiving element array for B/W in which the construction of the light receiving element is the same as above-mentioned light receiving element array for color ingredients, in which a plurality of the light receiving elements which perform photoelectric conversion on the reflected light from the original paper are arranged in the main scanning direction

wherein a timing generation circuit which gives timing signal to which resolution of a B/W signal is higher than that of a color signal in the sub scanning direction, and a color signal compensation circuit mentioned in claim 19.